



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604**

DATE: See date of Section Chief signature

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Waste Connections Winnebago Landfill, Rockford, IL

FROM: Daniel Heins, Environmental Scientist
AECAB (IL/IN)

THRU: Nathan Frank, Section Chief
AECAB (IL/IN)

TO: File

BASIC INFORMATION

Facility Name: Waste Connections Winnebago Landfill

Facility Location: 8403 Lindenwood Rd, Rockford, IL 61109

Date of Inspection: Virtual Opening Conference: May 10, 2021
On Site Inspection: June 1, 2021
Closing Conference: June 1, 2021

EPA Inspector(s):

1. Daniel Heins, Environmental Scientist
2. Vicky Mei, Environmental Engineer
3. Karina Kuc, Environmental Engineer
4. Konstantinos Loukeris, Environmental Engineer

Other Attendees:

1. Lacy Ballard, District Manager – Waste Connections
2. Dominic Remmes, Region Engineer – Waste Connections
3. Matt Crockett, Region Engineer – Waste Connections
4. Ryan Daniels, Environmental Specialist – Waste Connections
5. Connor Riordan, Technician – Waste Connections (on-site inspection only)
6. Tom Hibbert, Region Engineer – Waste Connections (on-site inspection only)
7. Josh Hay, SEM Technician – Andrews Engineering (on-site inspection only)

8. John Perkey, Counsel / Director of Air Compliance – Waste Connections (remote conference only)
9. Kaare Jacobsen, Solid Waste Division – Illinois EPA (IEPA)

Contact Email Address: Lacy.Ballard@wasteconnections.com

Purpose of Inspection: To determine Clean Air Act (CAA) compliance and perform a comparative Surface Emissions Monitoring (SEM) survey

Facility Type: Municipal solid waste (MSW) landfill

Regulations Central to Inspection: 40 C.F.R. Part 60, Subpart XXX; 40 C.F.R. Part 63, Subpart AAAA, Title V Permit Requirements

Virtual Conference (5/10) Start Time: 14:30

Virtual Conference (5/10) End Time: 16:30

On Site (6/1) Arrival Time: 9:15

On Site (6/1) Departure Time: 16:30

Inspection Type:

- ☐ Unannounced Inspection
- ☒ Announced Inspection

OPENING CONFERENCE

- ☒ Presented Credentials
- ☒ Stated authority and purpose of inspection
- ☐ Provided Small Business Resource Information Sheet
- ☒ Small Business Resource Information Sheet not provided. Reason: Not a small business
- ☒ Provided CBI warning to facility

The following information was obtained verbally from Waste Connections representatives.

Process Description:

Winnebago Landfill (the Landfill) is a municipal solid waste (MSW) landfill located in Rockford, Illinois. The Landfill is made up of four discontinuous pieces: the combined North Unit and South Expansion Units (NU, SEU), the Northern Expansion Unit (NEU), West Expansion Unit (WEU) and the East Expansion Unit (EEU). Waste received is approximately 60% MSW, 20% construction and demolition (C&D), and 20% soils, with small amounts of special wastes. Tarps, wood chips, processed landscaping waste, contaminated soils, and foundry sands are used as alternate daily cover (ADC). C&D fines are no longer used for ADC, though it historically was used at the WEU and NEU.

The NU was the original landfill at the site and was closed and capped in the 2000s. It is a pre-subtitle D landfill with an asphalt liner. The SEU has a liner that is an overlay onto the south side

of NU and began filling in the 1990s as an expansion to the NU. Its final closure was in 2009. The two units are continuous and together have about 60 wells producing up to about 1000 cubic feet per minute (cfm) of landfill gas (LFG).

The NEU received MSW from 2009 to 2015. It still receives contaminated soils and asbestos, with approximately 5 years left in its life based on current acceptance rates. The NEU receives anywhere from 0 to 6,000 tons per day of soils. Contaminated soils are profiled and analyzed to ensure they are non-hazardous. Intermediate cover can be up to 30 feet thick with the contaminated soils. Temporary geomembrane scrims were installed on the south and southwest facing slopes in 2021 and 2019, respectively. This has been to address odor concerns. So far, 24 acres have been placed under composite membrane with protective soils, though this is not a full final cap. The NEU has approximately 130 wells which collect approximately 3,000 cfm of LFG.

The WEU stopped receiving waste at the end of 2020. Currently 10 acres are under composite membrane with protective soils. An additional 47 acres are being graded and prepared for being placed under membrane this year. The final cover with vegetative layer is planned for 2022. The WEU has approximately 88 vertical wells, as well as a handful of toe collectors that will be removed with closure. These all together collect up to around 3,300 cfm of LFG.

The EEU began receiving waste in 2019 and does not have a gas collection and control system (GCCS) in place yet, as the waste is less than five years old and none of the EEU is at final grade. It will be 225 acres and is currently developed to approximately 90 acres. At current rates, this will be able to accept waste for another 15 years. The EEU typically receives up to 9,000 tons of waste per weekday, and around 2,000 tons on Saturdays.

Leachate is not recirculated and there is no direct liquid addition. Liquid waste is received, profiled, and poured into beds with absorbents prior to being deposited. The subtitle D sections of the landfill have leachate drainage systems which pumps to tanks to then be sent to the Rock River publicly owned treatment works (POTW). No pre-treatment is done. Previous issues with arsenic exceedances were corrected by mixing the different sources of leachate before sending the leachate to the POTW. Leachate volumes are increasing significantly, with 11 to 12 million gallons collected per year currently.

There are 40 wells with dewatering pumps at the NEU, with none at the WEU, NU, or SEU. Another 10 to 15 pumps are planned for the NEU. A consent order with the State of Illinois requires quarterly monitoring of depth to liquid, total liquid head, and percent of screen submerged in the gas collection wells.

Three flares are used to control the collected LFG. Gas from all of the units are co-mingled and by default all flares are operating at all times. The system capacity is 10,500 standard cubic feet per minute (scfm), with one flare at 2,500 scfm and two at 4,000 scfm. The system is typically collecting about 8,000 scfm, and so the system does not have capacity for one of the 4,000 scfm flares to go down. Some gas from the NEU and all gas from the WEU is treated to remove sulfur. The sulfur treatment has four media bed boxes, run two at a time. When one pair of boxes see sulfur breakthrough the gas is routed to the other pair. Waste Connections changes out the media of the sulfur treatment system approximately every two weeks after both pairs of boxes

see breakthrough. When changing out the media, they stop collecting gas for 8 to 10 hours. The header vacuum at the blowers is 55 inches of water, but 25 inches are lost through the sulfur treatment system, resulting in a system vacuum of 20 to 25 inches.

Staff Interview:

When EPA asked if there was any policy for when to install a de-watering pump in a well, Lacy Bollard stated that there is no prescriptive guide, but decisions are made based on water level, on-site observations, surface emissions monitoring (SEM) results, and gas quality. He agreed that it was conceivable that a well with long term 100% water obstruction would not necessarily be targeted for adding a de-watering pump if its wellhead parameters were in compliance and no SEM exceedances were found nearby. De-watering pumps are generally considered a last resort due to their technical challenges. SEM, odor detection, and cover integrity observations are used to determine whether a well is collecting all of the gas being generated near it.

The NEU has approximately 50 more wells than in the original GCCS design plan. The density of wells was originally increased so that the radius of influence and pull could be reduced to decrease air infiltration for a potential renewable natural gas (RNG) plant. Potential RNG plans have adjusted to have more flexibility with gas quality so all of the wells are being operated now with full vacuum to reduce concerns of fugitive emissions.

When EPA asked why the GCCS is shut down for when they change the carbon beds used for sulfur removal, Waste Connections stated that they cannot change the carbon media for one pair of beds while the other is running because of leaking gas creating a hydrogen sulfide exposure risk. They stated that the sulfur rich gas eats away at the valve seals resulting in leakage. Waste Connections plans on installing a new sulfur treatment system by fall 2021, which will eliminate the shutdowns at changeouts. The new system should increase GCCS system vacuum to 50 inches. Waste Connections is looking into starting a renewable natural gas facility at Winnebago, but this is not a solidified plan at this time.

Waste Connections contracts the SEM to Andrews Engineering. SEM is conducted in an enhanced program pursuant to a state consent order. The WEU and NEU are monitored monthly, while the NU/SEU is monitored quarterly. The exceedance threshold per the order is 300 parts per million (ppm), stricter than the New Source Performance Standard threshold of 500 ppm. The SEM plan requires monitoring at a grid of points as well as penetrations and at any visual indicators of potential leakage, and has an additional requirement for keeping average methane concentration below a threshold of 50 ppm averaged over grid cells designated on the landfill surface. Lacy Ballard and Josh Hay stated that historically, technicians only recorded the approximate average reading at each point, instead of recording the maximum reading observed as per Method 21.

There is one gas boundary probe on the NU, close to the boundary with the SEU on their east side, that has had problems with gas migration hits. Two other locations have been addressed with slat collectors. Waste Connections stated that they have no action plan yet for this probe.

The Landfill has historically received a large number of complaints, typically in waves. Lately there has been a lull in complaints. When Waste Connections receives a complaint, they check the location and wind direction.

The EEU will have an entirely separate GCCS, not co-mingled with the existing flares. NSPS gas collection requirements are not yet effective for the EEU because none of the unit is at final grade and all waste there is less than 5 years old.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:

EPA and IEPA conducted a partial SEM survey of the facility, with Josh Hay, a technician from Andrews Engineering confirming readings. The NEU was surveyed in the morning, and the WEU was surveyed in the afternoon. Exceedances of above 300 and 500 ppm total hydrocarbon (THC) as methane were recorded. Confirmation measurements were taken when a second instrument was available. Thirty-two SEM hits above 300 ppm were found on the NEU, of which 24 were above 500 ppm. Thirty-six hits above 300 ppm were found on the WEU, of which 35 were above 500 ppm. Hits were found both at penetrations and mid-landfill. The full SEM data and map of hits can be found in Appendix B.

WEU well #8 had a hole in the PVC header. Large portions of both the WEU and NEU were bare soil. EPA observed erosional features and leachate breakouts. Some areas of the landfill appeared to have persistently elevated methane concentrations above 100 ppm, though EPA did not evaluate if these areas were above the 50 ppm grid-average threshold from the consent order.

The instrument Josh Hay used had a length of PVC pipe affixed surrounding the probe tip. Mr. Hay stated that it was sized so when the end of the pipe was placed flush on the ground that the probe tip would be 10 centimeters from the ground. He stated that when taking a measurement at a point, he would place the probe straight down on the landfill surface and wait for two times the response time to get a reading. When asked about monitoring in areas where the temporary geomembrane scrim sat above the surface of the landfill, he said that he would try to push it down to the soil to take the reading. EPA found that this was not possible at many penetrations, as the scrim was pulled upward at the base of the wells. As a result, neither EPA nor Josh Hay were able to monitor fully around the base of many wellheads under the temporary scrims.

Clouds of dust were seen coming off of the NEU.

Photos and/or Videos: were taken during the inspection.

Field Measurements: were taken during this inspection.

RECORDS REVIEW

Requested and reviewed prior to inspection:

- Cover integrity reports, from May 2020 to present
- PDF of the most current depiction/map of the GCCS system
- Map depiction of where the current working active face is located and the extent of final/intermediate cover
- Current GCCS Design Plan
- NSPS SEM reports (including any follow-up monitoring) from Q2 2020 to present with all associated recorded data
- Most recent depth to water measurements for each well with percent of perforation available and date of measurement, in a spreadsheet format
- Wellhead parameters monitoring (in spreadsheet format), including records for correction of any exceedances, from May 2020 to present
- Control device parameter monitoring (e.g. temperature and LFG flow to flare) in a spreadsheet format, from May 2020 to present
- List of any wells installed from May 2020 to present with reason for installation
- Waste accepted by category over the past 12 months, in a spreadsheet format if available
- Any performance tests for any control devices on site conducted from May 2020 to present, including but not limited to flares and any gas-to-energy engines/turbines
- Any gas sampling test reports (such as for HAP or for sulfur) from May 2020 to present
- All submitted semi-annual reports from May 2020 to present
- Any other records of emissions monitoring conducted over the past 12 months not included in the above
- Submitted applications for all active air permits
- A log of all citizen complaints and corresponding followup actions from May 2020 to present

CLOSING CONFERENCE

- ☒ Provided U.S. EPA point of contact to the facility

Waste Connections stated that it would be interested in performing SEM monitoring via drone to reduce burden on technicians, however this would only be if it could fully replace the on-the-ground monitoring for compliance purposes. They additionally indicated that when they have a renewable natural gas plant that they would potentially be open to using well auto-tuning to maximize gas collection.

Requested documents:

- Leachate system map
- Copy of third party report evaluating GCCS
- Written operating procedures (plus correction procedures), if any, on:
- Cover integrity;
- De-watering, re-drills;
- Pump maintenance report from 2020
- Gas and leachate flow rates by units (from the past 3 years)

- SSM logs (from the past 3 years)
- Media swap out logs (from the past 3 years)
- Odor Plan with use of scentometer/H2S measurements
- Documentation of repair/re-monitoring of exceedances found

Compliance Assistance: EPA gave input on how to properly conduct Method 21.

Concerns: EPA found a high rate of SEM hits, distinctly above historic rates. Some hits were at locations that were supposed to have been recently corrected. EPA was also concerned that their sulfur treatment system requires such large gas collection downtime on a regular basis.

DIGITAL SIGNATURES

Daniel Heins, Report Author

Nathan Frank, Section Chief (IL/IN)

Facility Name: Winnebago Landfill

Facility Location: 8403 Lindenwood Rd, Rockford, IL 61109

Date of Inspection: May 10 & June 1, 2021

APPENDICES AND ATTACHMENTS

Appendix A: Digital Image Log

Appendix B: Field Measurement Data, Including Maps

Facility Name: Winnebago Landfill

Facility Location: 8403 Lindenwood Rd, Rockford, IL 61109

Date of Inspection: May 10 & June 1, 2021

APPENDIX A: DIGITAL IMAGE LOG

1. Inspector Name: Daniel Heins	2. Archival Record Location: ERC - Enf_WinnebagoLandfill_IL_21
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Image Number	File Name	Date/Time (Eastern)	Description of Image
1	IMG_0313.JPG	2021-06-01 11:09	NEU Well 101, with leachate leak
2	IMG_0314.JPG	2021-06-01 14:56	Dust clouds on NEU, as viewed from top of WEU
3	IMG_0315.JPG	2021-06-01 14:56	Dust clouds on NEU, as viewed from top of WEU
4	IMG_0316.JPG	2021-06-01 15:08	Leachate breakout near Well 87 (WEU)
5	IMG_0317.JPG	2021-06-01 15:44	WEU Well 8, with hole in pipe.

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APPENDIX B: FIELD MEASUREMENT DATA

North Expansion Unit Hits

Well Number or Map Label	Latitude	Longitude	Reading 1 Value (ppm)	Reading 1 Inst	Reading 2 Value (ppm)	Reading 2 Inst	Other Notes
A	42.161223	-89.05788	788	KL	476	KJ	
B	42.161662	-89.057726	820	KL	520	KJ	
C	42.161754	-89.057755	450	KL	387	KJ	
D	42.162186	-89.05799	750	KL	>300	KJ	
F	42.16226	-89.057761	2620	KL	558	KJ	Two adjacent flags
105	42.163882	-89.062575	500	KL	450	JH	
H (Leachate Riser)	42.161623	-89.06337	500	KK	460	KL	
I (NEU Header)	42.159925	-89.061337	3000	KL	2000	JH	
4	42.160004	-89.060532	600	KL	330	VM	
J (South slope header valve)	42.160046	-89.060286	1500	VM	2500	KJ	
K	42.162379	-89.058211	350	VM			generally elevated area, 100 to 200 ppm verified by Connor. Area of erosion
L	42.164094	-89.060831	350	VM	350	KL	generally elevated area, 100 to 200 ppm
45	42.1629	-89.06432	4000	DJH	1.50%	KK	Broken air line
36	42.162513	-89.063782	1195	KL	2000	KK	
M	42.162382	-89.063477	642	KL	500	KK	Erosion trench
29	42.162286	-89.063297	430	KL	450	KK	
N	42.162324	-89.063398	750	KL	1000	KK	
O	42.162176	-89.063302	1000	KK	670	JH	
L404	42.160401	-89.061938	1400	DJH	3200	JH	
5	42.159991	-89.061222	1%	KK	1500	JH	
9	42.160546	-89.060798	3%	KK	10000	KL	
8	42.160548	-89.059938	1%	KK	4000	JH	
115	42.160669	-89.05876	1%	KK	2000	JH	

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North Expansion Unit Hits (continued)

Well Number or Map Label	Latitude	Longitude	Reading 1 Value (ppm)	Reading 1 Inst	Reading 2 Value (ppm)	Reading 2 Inst	Other Notes
37	42.163023	-89.058223	2%	KK	1200	JH	
21	42.161302	-89.062344	1200	DJH	450	JH	
R	42.1616333	-89.0578	515	KJ			
S	42.1616833	-89.0578	315	KJ			
T	42.1618167	-89.05775	337	KJ			
U	42.1621667	-89.05775	336	KJ			
W	42.1623833	-89.057867	505	KJ			
X	42.1623333	-89.058017	1902	KJ			
95	42.161677	-89.058784	384	KJ			

West Expansion Unit Hits

Well Number or Map Label	Latitude	Longitude	Reading 1 Value (ppm)	Reading 1 Inst	Reading 2 Value (ppm)	Reading 2 Inst	Other Notes
D	42.152918	-89.066368	500	KL	396	KL	
C	42.153208	-89.06625	360	KL	300	KK	
68	42.153189	-89.065892	650	KL	500	KK	
77	42.153121	-89.073107	13000	KL	10000	KK	
B	42.154454	-89.066112	500	KK	315	KL	
2	42.154478	-89.066233	500	KK	430	KL	
36	42.153822	-89.071972	6000	KL	1%	KK	
37	42.154748	-89.069548	14000	KL	3%	KK	
49	42.154414	-89.070862	6000	KL	12000	KK	
A	42.154331	-89.0717	8746	KJ	6000	KL	Gurgling, possible leachate problems
60	42.152764	-89.071027	1%	KK	800	JH	
23	42.152769	-89.067997	1000	KK	3315	JH	flag from Q1 March
20	42.152524	-89.067284	1000	KK	250	JH	
19	42.152979	-89.067344	1800	DJH	1100	JH	
24	42.153215	-89.067727	2400	DJH	5800	JH	Prior Flag
84	42.15356	-89.06786	800	DJH	950	JH	Prior Flag
18	42.153597	-89.067555	5%	DJH	2500	JH	Prior Flag
81	42.154256	-89.067154	2%	DJH	1300	JH	
16	42.15451	-89.067526	1.30%	DJH	3717	JH	

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West Expansion Unit Hits (continued)

Well Number or Map Label	Latitude	Longitude	Reading 1 Value (ppm)	Reading 1 Inst	Reading 2 Value (ppm)	Reading 2 Inst	Other Notes
35	42.154286	-89.068911	2000	DJH	4525	JH	
39	42.15388	-89.069742	1.20%	DJH	8715	JH	
34	42.153675	-89.069228	4.20%	DJH	5.5%	JH	
46	42.153918	-89.068813	3%	DJH	2.8%	JH	
27	42.153899	-89.068269	2200	DJH	1750	JH	
83	42.154069	-89.06785	1700	DJH	1225	JH	
28	42.153548	-89.068441	4500	DJH	1503	JH	
86	42.153377	-89.06905	5%	DJH	2.6%	JH	
40	42.153294	-89.06976	6000	DJH	2300	JH	
51	42.15356	-89.069993	3.50%	JH			
50	42.153998	-89.070731	1900	JH			
58	42.153705	-89.071476	3250	JH			
E	42.1524667	-89.073817	503	KJ			
F	42.1518333	-89.072	667	KJ			
G	42.1518167	-89.071933	1930	KJ			
H	42.15185	-89.071817	516	KJ			
I	42.1518667	-89.071433	1118	KJ			

Note: Some latitude/longitude readings for hits at wellheads are approximated from a georeferenced GCCS map. Non-wellhead coordinates are derived from handheld GPS units.

Calibration and Instrument Information

- Karina Kuc (KK) used A56584 for the duration of the survey.
- Kosta Loukeris (KL) used SL1555 for the duration of the survey.
- Vicky Mei (VM) used A56575 until 11:10 AM, after which point Daniel Heins (DJH) used this instrument for the rest of the survey.
- Kaare Jacobsen (KJ) and Josh Hay (JH) used IEPA and Andrews Engineer equipment, respectively, for the duration of the survey.

	A56584	SL1555	A56575
8:30 AM average calibration reading with 500 ppm gas	491	493	493
4:00 PM drift check reading with 500 ppm gas	476	450	[Instrument ran out of hydrogen gas towards end of survey, but had all exceedances confirmed with second instrument]

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Instrument response times were between 4 and 5 seconds.

EPA calibration gases:

- Air, zero grade, THC < 1 ppm, expiration 05/2026
- Methane 500 ppm, expiration 05/2025

The upwind and downwind readings were taken with SL1555.

Upwind: 0.5 ppm

Downwind: 0.7 ppm

Map of Detected Hits

SEM hit locations plotted over satellite imagery from April 7, 2019 as depicted on Google Earth.

West Expansion Unit



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North Expansion Unit



Facility Name: Winnebago Landfill

Facility Location: 8403 Lindenwood Rd, Rockford, IL 61109

Date of Inspection: May 10 & June 1, 2021

North Expansion Unit west slope in detail

